

## REMARKS/ARGUMENTS

The Office Action mailed June 16, 2004 has been carefully considered.

Reconsideration in view of the following remarks is respectfully requested.

### Claim Status and Amendment to the Claims

Claims 1-8 are now pending. No claims stand allowed.

Claim 2 has been amended to correct minor errors of a clerical nature.

### The First 35 U.S.C. § 103 Rejection

Claims 1-3, 5-8 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Wei (U.S. Pat. No. 5,435,608) in view of Kobayashi et al. (U.S. Pat. No. 4,907,040), among which claims 1 and 2 are independent claims. This rejection is respectfully traversed.

According to M.P.E.P. §2143,

To establish a *prima facie* case of obviousness, three basic criteria must be met. First there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the applicant's disclosure.

Furthermore, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). If

proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

Claim 1 defines an X-radiation imagery device comprising at least one detection matrix made of a semiconducting material. The detection matrix comprises pixels to convert incident X-photons into electric charges and an electric charges reading panel comprising several electronic devices, each electronic device being integrated by pixel. The claimed X-radiation imagery device is characterized in that each detecting matrix includes a detection layer made of a continuous layer of semiconducting material deposited in vapour phase on the electric charges reading panel, as recited in claim 1.

Claim 2 defines a process for making an X-radiation imagery device comprising at least one detecting matrix made of a semiconducting material, where the detecting matrix comprises pixels to convert incident X-photons into electric charges, and an electric charges reading panel comprising several electronic devices, each electronic device being integrated by pixel. The claimed process is characterized in that each detecting matrix is obtained by vapour phase deposition of a semiconductor on the

electric charges reading panel, each detecting matrix including a detection layer made of a continuous layer of semiconducting material, as recited in claim 2.

Accordingly, claim 2 includes substantially the same distinctive features as claim 1. In addition, it should be noted that the claimed “continuous layer of semiconducting material” is that in the X-radiation imagery device, not a layer which is only present at an intermediate stage of the manufacturing process of the device.

In the Office Action, the Examiner specifically contends that the elements of the presently claimed invention are disclosed in Wei except that Wei does not teach a detection layer which is made of a continuous layer of semiconducting material deposited in vapour phase. The Examiner further alleges, however, that Kobayashi teaches the continuous layer of semiconducting material deposited in vapour phase, and that it would be obvious to one having ordinary skill in the art at the time of the invention to incorporate Kobayashi’s vapor deposited continuous layer of semiconducting material into Wei’s radiation imager device in order to increase the effective detection area (Office Action, page 5, lines1-3). The Applicants respectfully disagree for the reasons set forth below.

Regarding Kobayashi’s alleged continuous semiconductor layer, column 24, lines 49-52 of Kobayashi cited by the Examiner merely teaches forming a continuous semiconductor thin film on the scanning electrode layer and the pixel electrode lead layer by plasma CVD (chemical vapor deposition) in an intermediate stage of manufacturing

an active matrix element. That is, the thus-formed “continuous semiconductor thin film” and the metal thin film for the second electrode layer are subsequently patterned into a semiconductor layer **3** and the second electrode layer **5**, respectively, which continuously extend to entirely cover the scanning electrode layer **1** and pixel electrode lead layer **2** along the widthwise direction (see column 24, lines 56-62, and FIGS. 11A and 11B of Kobayashi). Thus, the alleged “continuous thin film” only exists temporally after the plasma CVD process until it is patterned into the small semiconductor layer **3** so as to form an active matrix element (switching element). When the alleged continuous semiconductor layer is present, Kobayashi’s device is still under the manufacturing process and is not operable. In addition, since Kobayashi’s semiconductor layer **3** is used for the active element, Kobayashi also fails to suggest using or forming any continuous thin film for a detection layer. Accordingly, similarly to Wei, Kobayashi fails to teach or suggest any continuous layer of semiconducting material deposited in vapour phase on the electric charges reading panel, as recited in claims 1 and 2.

In addition, it should be noted that Kobayashi’s teaching is only forming the alleged continuous semiconductor thin film for a switching element during the manufacturing process of the active matrix element. Thus, if one of ordinary skill in the art should combine Kobayashi’s teaching with Wei, he/she would first form an allegedly continuous semiconductor material layer for Wei’s semiconductor material layer **154**, which exactly corresponds to Kobayashi’s semiconductor layer **3**, on the dielectric layer **140** (see FIG. 1c of Wei) using plasma CVD, and then pattern the alleged continuous

semiconductor material layer into the semiconductor material layer **154** as shown in FIG. 1c, exactly following Kobayashi's teaching.

Accordingly, Wei, whether considered alone or combined with or modified by Kobayashi, does not teach or suggest the claimed detecting matrix which includes a detection layer made of a continuous layer of semiconducting material deposited in vapour phase on the electric charges reading panel, as recited in claims 1 and 2.

Furthermore, cited references also fail to suggest the desirability of the combination or any motivation of such combination for the reason set forth below.

In the Office Action, the Examiner particularly referrs to Wei's column 5, line 60 to column 6, line 10 for the alleged teaching of "each detecting matrix made of a layer of semiconducting material deposited in vapor phase on the electric charges reading panel." The cited portion reads as follows:

TFT body **152** comprises a semiconductor material layer **154** disposed over gate dielectric layer portion **142**; the semiconductor material typically comprises amorphous silicon (a-Si) that is deposited in a chemical vapor deposition process to a thickness in the range between about 1500.ANG. and 5000.ANG.. TFT body further comprises a doped semiconductor material layer **156** disposed over semiconductor material layer **154**; doped semiconductor layer **156** typically comprises a-Si doped to exhibit n+ conductivity (e.g., having a conductivity greater than about 10.sup.-3 .OMEGA.-cm).sup.-1 that is deposited in a PECVD process to a thickness in the range between about 300 .ANG., and 1000.ANG.. Semiconductor material layer **154** and doped semiconductor material layer **156** are then patterned (e.g., etched in accordance with known procedures, such as photolithography) such that the layers extend over and slightly beyond gate electrode **122** as illustrated in FIG. 1(d) so as to form TFT body **152**. (Column 5, line 60 though column 6, line 10 of Wei)

Thus, the alleged “layer of semiconducting material” is the semiconductor material layer **154** (and possibly the doped semiconductor material layer **156**) illustrated in FIG 1c of Wei. However, as described in the above-cited portion, the alleged semiconductor layer is part of the TFT body **152**. As is well known to those of ordinary skill in the art, a TFT (thin film transistor) is an active switching element, and Wei’s semiconductor layer is used as an active layer within the switching element (see FIGS. 1d through 1f of Wei). Accordingly, if the semiconductor material layer **154** of Wei should be extended beyond the TFT body **152** over Wei’s detecting matrix (i.e., an array of pixels **110**) so as to form the claimed “continuous layer of semiconducting material” as the Examiner alleges, such a modification would completely destroy the TFT’s switching function in Wei’s device. Since Wei’s image detection is based on a plurality of individually-addressable pixels which require respective active switching elements (column 8, lines 18-19 thereof), the alleged modification would render Wei’s device as modified inoperable or at least unsatisfactory for its intended purpose, and thus there is no suggestion or motivation to make the proposed modification. In addition, since Wei’s semiconductor material layer **154** is within the TFT and does not participate in image detection, the alleged motivation of obtaining “grater effective detection area” also fails.

Furthermore, if the Examiner should mean to mean Wei’s photosensitive layers **132**, **134**, and **136** in the photodiode **130** (column 4, lines 47-13, FIG. 1b thereof) by the alleged “matrix of detection areas with a smaller effective detection area,” the alleged modification would extend Wei’s photosensitive layer beyond respective photodiodes (photo sensor islands) **130** and make the photosensitive layer continuous across pixels

110. However, such a continuous layer of photosensitive material would also destroy Wei's photo detection function, since the allegedly modified device no longer has isolated photo sensor islands which can be individually addressed. If a photosensitive layer (photo detection layer) is to be formed continuously across the plurality of pixels 110, Wei's device cannot detect any image as it lacks individually-addressable photo sensors. Accordingly, this possibly alleged modification would also render Wei's device as modified inoperable or at least change the principle of operation, and thus the teachings of Kobayashi are not sufficient to render the claims *prima facie* obvious.

Accordingly, it is respectfully requested that the rejection of claims based on Wei and Kobayashi be withdrawn. In view of the foregoing, it is respectfully asserted that the claims are now in condition for allowance.

Dependent Claims

Claims 3-6 depend from claim 2, and claims 7-8 depend from claim 1, and thus include the limitations of claims 2 and 1, respectively. The argument set forth above is equally applicable here. The base claims being allowable, the dependent claims must also be allowable at least for the same reasons.

In view of the foregoing, it is respectfully asserted that the claims are now in condition for allowance.

Conclusion

It is believed that this Amendment places the above-identified patent application into condition for allowance. Early favorable consideration of this Amendment is earnestly solicited.

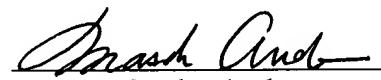
Request for Interview

Applicants respectfully request an interview to expedite the prosecution of this application. Submitted herewith is an Applicant Initiated Interview Request Form. The Examiner is invited to call the undersigned attorney at the number indicated below to schedule a telephonic interview to discuss the matter.

The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-1698.

Respectfully submitted,  
THELEN REID & PRIEST, LLP

Dated: September 16, 2004

  
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Limited Recognition under 37 CFR §10.9(b)

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